Florida Elementary 2011-12 School Grades Adjusted for Poverty and Minority Status and the Performance of Charter Schools

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The purpose of this study is to present an unbiased, apolitical analysis of the effect of poverty on recent school grade scores presented by the Florida Department of Education (FDOE). For a description of the determination of the grades please refer to the Press Guide Packet for the preliminary scores as of July 25, 2012 at http://schoolgrades.fldoe.org/pdf/1112/SchoolGradesPressPacket.pdf. The scores for the non-high schools are preliminary in that some of them may be subject to appeal. For a description of school grades please refer to Grading Florida's Schools 2012 at http://schoolgrades.fldoe.org/pdf/1112/Guidesheet2012SchoolGrades.pdf. The data used in the analysis are provided in an excel file and are arranged by school (county) districts in alphabetical order.

Effects of Poverty and Minority Statuses

To capture the effects of poverty (as proxied by the percent of students who qualify for a free or reduced lunch, hereafter referred to as %FREE) and minority status (as proxied by the percent of students who are minorities, hereafter referred to as %MIN) I ran a regression analysis of the 1812 elementary schools where the dependent variable was the preliminary school score available on July 25, 2012. See Table 1 at the end of the paper. The adjusted R^2 is 0.495. In other words, those two variables "explained" 49.5 percent of the variation in the school test scores. I am not suggesting that better models cannot be developed with more characteristics but this model is much better than viewing the raw school scores without any adjustment.

This result is the justification for adjusting the school test scores to reflect the characteristics of the students each school serves. These statistical results are similar to what one might find when trying to explain a person's weight. We would not evaluate a person's weight without asking what the person's height is because we know that height is a major factor in determining weight. The adjusted scores adjust for poverty and minority status in a manner similar to the body mass index (BMI) in that it adjusts weight for height.

The statistical results indicate that the mean or average school score is 525 and the median is 521 with a range from 215 to 782. The mean %FREE is 67% and the median is 73% with a range from 0% to 100%. The mean %MIN is 61% and the median is 59% with a range from 4% to 100%.

The regression analysis indicates that as the %FREE increases by 1% from the average of 67.45% the school score decreases by 2.18326 points. The analysis also indicates that as the %MIN increases by 1% from the average of 60.57% the school score increases by 0.216369 points. In other words, after poverty is controlled the minorities do better than the non-minorities. The types of minorities are not provided so one must be careful in generalizing this result for any specific minority group.

Performance of Charter Schools

When a charter school variable (zero if non-charter and one if charter) for the 147 charter schools (8.1% of the total number) is added to the regression model above the coefficients for the other variables are similar and the results indicate that charter schools have a lower average school score of 28.43 points. See Table 2 at the end of the paper. All of the independent variables in this regression and the previous one are significant at the .00001 level. In other words, when the poverty and minority characteristics of the student population are controlled, the average charter school performs significantly lower than the average traditional public school. If the poverty and minority statuses are not controlled the average charter school is less than one point lower than the non-charter schools with charter schools having an average score of 524.66 and the non-charter schools having an average score of 525.23. The average %FREE for charter schools is 57% and for non-charter schools is 68% indicating that non-charter schools have a higher percentage of students who live in poverty or near poverty. The average %MIN for charter schools is 68% and for non-charter schools is 60% indicating that charter schools have a higher percentage of minorities than non-charter schools.

Adjusted School Scores and Grades

I will now return to the regression analysis without the charter school variable in Table 1. With these results the actual score is adjusted by increasing the score by 2.18326 points for every 1% %FREE above the average of 67.45% and reduce the score by decreasing the score by 0.216369 points for every 1% %MIN above the average of 60.57%.

The actual scores and the scores adjusted for poverty status and minority status are provided in the attached excel file. The actual school grade and the adjusted school grade are also provided. The school grades are based on a scale of A (greater than or equal to 525 points); B (495-524 points); C (435-494 points); D (395-434 points); and F (less than 395 points). Twenty-eight of the 147 charter schools had a score assigned to them but did not have a grade assigned to them; therefore, no grade is assigned on the adjusted scores. Although it is not reported here for brevity, an analysis showed the charter schools with no assigned grades had a lower average score of 62 points and the other 119 charter schools with assigned grades had a lower average score of 21 points when compared with non-charter schools.

The absolute value of the change in score due to the adjustment for poverty and minority statuses is 41.5 points or 7.9% of the average score of 525. The effect on grades can be great or no effect. If an A-rated school is at 526 before the adjustment and its score decreases by 40 points, the adjusted score of 486 now is consistent with a C rating. The opposite can occur too. A C-rated school with a score of 486 could have a score increase of 40 points up to 526, which is consistent with an A-rated school. These

changes in grades demonstrate how sensitive the adjusted scores are and how the unadjusted scores may be very misleading about how the school is doing with their specific students.

The adjusted scores resulted in 156 and 68 of the 849 A-rated schools decreasing to a B and C, respectively. Of the 442 B-rated schools the adjusted grades resulted in 232 with upgrades to an A rating and 68, 3, and 2 downgrades to C, D, and F ratings, respectively. Of the 326 C-rated schools the adjusted grades resulted in 61 and 119 upgrades to A and B ratings, respectively, and 4 and 1 downgrades to D and F ratings, respectively. Of the 135 D-rated schools the adjusted grades resulted in 4 and 119 upgrades to B and C ratings, respectively, and 1 downgrade to an F. Of the 22 F-rated schools the adjusted grades resulted in 5 and 10 upgrades to C and D ratings, respectively. In summary, of the 1784 schools with assigned grades 550 (31%) had upgrades, 303 (17%) had downgrades, and 931 (52%) had no changes.

Conclusion

These results call into question the emphasis by the Republicans on charter schools. The average charter school is doing about the same as the non-charter school when no adjustments are made for poverty and minority statuses. When the adjusted scores are considered the average charter school performs significantly worse than the average non-charter school. This does not mean that ALL charter schools are performing worse than non-charter schools, even with the adjustments; however, it does mean that a parent has to be even more careful about enrolling his or her child in a charter school than in a non-charter school. Although charter schools may be cheaper for the state to fund, the adjusted scores suggest that Florida is also getting a lower return on these schools. Is the lower average return on these schools worth the lower cost?

Table 1

Y = 2011-12 Preliminary School Score

Regression Statistics	
Multiple R	0.70398149
R Square	0.495589938
Adjusted R Square	0.495032271
Standard Error	49.96391523
Observations	1812

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	4437008.2	2218504	888.6839	1.472E-269
Residual	1809	4515974.6	2496.393		
Total	1811	8952982.8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	659.3471425	3.5130864	187.6832	0
%Free or Reduced	-2.1832606	0.0633861	-34.4438	2.4E-200
%Minority Rate	0.216368614	0.0560493	3.860328	0.000117

Table 2					
Y = 2011-12 Preliminary School Score					
Regression Statistics					
Multiple R	0.712078307				
R Square	0.507055515				
Adjusted R Square	0.506237576				
Standard Error	49.40645216				
Observations	1812				
ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	4539659.3	1513220	619.9186	4.7085E-277
Residual	1808	4413323.5	2440.998		
Total	1811	8952982.8			
	Coefficients	*Standard Error*	*t Stat*	*P-value*	
Intercept	663.4969362	3.5323381	187.8351	0	
CHARTER	-28.4304549	4.3841524	-6.48482	1.14E-10	
%Free or Reduced Lunch Rate	-2.28040746	0.0644443	-35.3857	7.3E-209	
%Minority Rate	0.294121086	0.056706	5.186772	2.38E-07	

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